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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,247	04/21/2004	Jun-Yeob Lee	1514.1043	4847

49455 7590 05/17/2007  
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EXAMINER
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YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

MAIL DATE	DELIVERY MODE
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05/17/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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**Office Action Summary**

Application No.

10/828,247

Applicant(s)

LEE ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 23 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-22 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. This Office action is in response to applicant's amendment filed February 09, 2007, which amends claims 1, 6, 7, 10, 12, 14, 15, 18 and 22-25.

Claims 1-25 are pending.

2. The rejection of claims 10 and 18 under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, as set forth in the Office action mailed November 15, 2006 is overcome by amendment.

The rejection of claims 14, 15 and 25 under 35 U.S.C. 102(b) as anticipated by Kamatani et al. (US 2003/0068526 A1) is overcome by amendment.

3. The claims stand subject to an election of species requirement. None of the pending claims read on the originally elected species (an iridium complex having three phenylisoquinoline ligands). The examiner continues examination on claims encompassing iridium complexes having three ligands that are the same. Applicant is cautioned that this does not represent an examination on the merits of all species within the scope of the examined claims.

4. Claims 5-7, 23 and 24 stand withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on August 23, 2006.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 8, 11-13, 16, 19, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Kamatani et al. (US 2003/0068526 A1).

Kamatani et al. disclose iridium compounds represented by present formula L2ML' and/or L3M for use in the emitting layer of an organic electroluminescent display device.

See the entire publication. In particular, see Fig. 1(a)-(c), paragraphs [0001], [0032]-[0040], [0101]-[0109], [0125]-[0126], [0150], [0174]-[0176] and [0195]-[0199], and the Tables beginning on page 11.

As examples of Kamatani's compounds that meet the limitations of the phosphorescent dopant as defined in present claims 1, 2, 12 and 13, and that meet the limitations of the emitting compound as defined in present claim 22, see Kamatani's Compound Nos. 25-28, 38-41 and 71-74.

Compound Nos. 25-28 are compounds represented by L2ML' wherein L and L' are identical and are compounds represented by L3M, wherein M is Ir and each ligand has more than 15 carbon atoms and is not a phenylisoquinoline. The ligands of Compound Nos. 25 and 26 are benzothienylisoquinoline ligands. The ligands of Compound No. 27 are naphthylisoquinoline ligands. The ligands of Compound No. 28 are fluorenylisoquinoline ligands.

Compound Nos. 38-41 are compounds represented by L2ML' wherein L and L' are not identical and L is a ligand having more than 15 carbon atoms and is not a phenylisoquinoline.

Compound Nos. 71-74 are compounds represented by L2ML' wherein L and L' are not identical and L' is a ligand having more than 15 carbon atoms and is not a phenylisoquinoline.

With respect to present claims 3 and 16, see paragraphs [0032]-[0033] for example. The limitations recited in claims 3 and 16 pertain to a conventional structure for full-color display devices.

With respect to present claims 8, 11, 19 and 21, see Fig. 1(a)-(c) and paragraphs [0102]-[0107] for example.

7. Claims 1-4, 8, 11-17, 19, 21, 22 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuboyama et al. (EP 1 239 526 A2).

Tsuboyama et al. disclose compounds represented by present formula L2ML' and/or L3M for use in the emitting layer of an organic electroluminescent display device.

See the entire publication. In particular, see Fig. 1(a)-(c), paragraphs [0001]-[0016], [0025]-[0036], [0056]-[0058] and [0070]-[0085].

Many of the compounds defined in the tables on pages 9-24 meet the limitations of the phosphorescent dopant as defined in present claims 1, 2, 12 and 13, and meet the limitations of the emitting compound as defined in present claim 22. Tsuboyama's compound Nos. 1, 349, 522 and 523 further meet the limitations of the phosphorescent dopant as defined in present claims 14 and 15, and the limitations of the emitting compound as defined in present claim 25.

Tsuboyama's compound 1 is present applicant's compound of Chemical Formula 23.

Tsuboyama's compound 349 is present applicant's compound of Chemical Formula 24.

Tsuboyama's compound 522 is present applicant's compound of Chemical Formula 30.

Tsuboyama's compound 523 is present applicant's compound of Chemical Formula 25.

With respect to present claims 3, 4, 16 and 17, see paragraphs [0026], [0034] and [0070]-[0085] for example. The limitations recited in claims 3 and 16 pertain to a conventional structure for full-color display devices. The display of prior art Example 7 is a specific example of a display device that meets the limitations of present claims 3, 4, 16 and 17. The display of Example 7 has subsidiary pixels of red, green and blue emitting layers, and the red emitting layer comprises Tsuboyama's compound No. 22, which is an iridium compound within the scope of the phosphorescent dopant as defined in claims 1, 2, 12 and 13 (and the emitting compound as defined in claim 22).

With respect to present claims 8, 11, 19 and 21, see Fig. 1(a)-(c) and paragraphs [0003]-[0016] and [0036] for example. The display device of prior art Example 7 is also a specific example of a display device that meets the limitations of these claims.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 4, 9, 10, 16-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamatani et al. (US 2003/0068526 A1) as applied to claims 1-3, 8, 11-13, 16, 19, 21 and 22 above, and further in view of Park et al. (US 2003/0042848 A1) and Yu et al. (US 2004/0094768 A1).

Kamatani et al. disclose iridium compounds represented by present formulae L2ML' and/or L3M for use as red-emitting phosphorescent materials in full-color display devices.

Kamatani et al. do not explicitly teach a full-color display device having red, green and blue emitting layers in which the blue emitting layer is a fluorescent emitting layer as required by present claims 4, 9, 10, 17, 18 and 20.

Park et al. and Yu et al. disclose full-color display devices having red, green and blue emitting layers in which at least one emitter is a phosphorescent emitter and at least one emitter is a fluorescent emitter. The blue emitting layer may be a fluorescent emitting layer. In Park's publication, for example, see Figures 4, 5 and 7-10, paragraphs [0013], [0018]-[0021], [0035]-[0040] and [0042]-[0051], and claims 1, 2, 8 and 9. In Yu's publication, for example, see Figures 1A-1E, 2A-2D and 3, and paragraphs [0001], [0037]-[0039], [0043]-[0045], [0048]-[0049] and [0059]-[0063]. The polymers taught in paragraph [0059] of Yu's publication are known fluorescent emitters.

Further with respect to the requirement of claims 9 and 20 for a hole blocking layer, Park et al. teach the use of a hole blocking layer over the phosphorescent emitter layers. For example, see paragraphs [0037] and [0040]. Note that paragraph [0040] implies that the red and green emitter layers, instead of the red and blue emitter layers, may be the phosphorescent emitter

layers. Yu et al. also teach that an electron injection/transport layer may be deposited over each of the red, green and blue emitter layers, and materials taught in paragraph [0063] for the electron injection/transport layer include materials known in the art to provide a hole blocking function.

Further with respect to the requirement of claims 10 and 18 that the blue fluorescent emitting layer be formed on an upper part of red and green phosphorescent emitting layers, Yu et al. teach that the blue emitter layer may be formed over the red and green emitter layers. For example, see paragraph [0048].

A full-color organic electroluminescent display device comprising a phosphorescent dopant as defined in present independent claims 1 and 12 was known in the art at the time of the invention as demonstrated by Kamatani et al. The further structural features of the device as required by present claims 4, 9, 10, 17, 18 and 20 were known in the art for full-color organic electroluminescent display devices comprising a phosphorescent dopant as demonstrated by Park et al. and Yu et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to make a full-color display device using a phosphorescent dopant as taught by Kamatani et al. utilizing structural features known in the art of full-color display devices such as those disclosed by Park et al. and Yu et al.

10. Claims 9, 10, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuboyama et al. (EP 1 239 526) as applied to claims 1-4, 8, 11-17, 19, 21, 22 and 25 above, and further in view of Park et al. (US 2003/0042848 A1) and Yu et al. (US 2004/0094768 A1).



Tsuboyama et al. disclose a full-color display having red, green and blue emitting layers, but do not explicitly teach all the limitations of present claims 9, 10, 18 and 20.

Park et al. and Yu et al. disclose full-color display devices having red, green and blue emitting layers in which at least one emitter is a phosphorescent emitter and at least one emitter is a fluorescent emitter. The blue emitting layer may be a fluorescent emitting layer. In Park's publication, for example, see Figures 4, 5 and 7-10, paragraphs [0013], [0018]-[0021], [0035]-[0040] and [0042]-[0051], and claims 1, 2, 8 and 9. In Yu's publication, for example, see Figures 1A-1E, 2A-2D and 3, and paragraphs [0001], [0037]-[0039], [0043]-[0045], [0048]-[0049] and [0059]-[0063]. The polymers taught in paragraph [0059] of Yu's publication are known fluorescent emitters.

With respect to the requirement of claims 9 and 20 for a hole blocking layer, Park et al. teach the use of a hole blocking layer over the phosphorescent emitter layers. For example, see paragraphs [0037] and [0040]. Note that paragraph [0040] implies that the red and green emitter layers, instead of the red and blue emitter layers, may be the phosphorescent emitter layers. Yu et al. also teach that an electron injection/transport layer may be deposited over each of the red, green and blue emitter layers, and materials taught in paragraph [0063] for the electron injection/transport layer include materials known in the art to provide a hole blocking function.

Further with respect to the requirement of claims 10 and 18 that the blue fluorescent emitting layer be formed on an upper part of red and green phosphorescent emitting layers, Yu et al. teach that the blue emitter layer may be formed over the red and green emitter layers. For example, see paragraph [0048].

A full-color organic electroluminescent display device comprising a phosphorescent dopant as defined in present independent claims 1 and 12 was known in the art at the time of the invention as demonstrated by Tsuboyama et al. The further structural features of the device as required by present claims 9, 10, 18 and 20 were known in the art for full-color organic electroluminescent display devices comprising a phosphorescent dopant as demonstrated by Park et al. and Yu et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to make a full-color display device using a phosphorescent dopant as taught by Tsuboyama et al. utilizing structural features known in the art of full-color display devices such as those disclosed by Park et al. and Yu et al.

11. Applicant's arguments filed February 09, 2007 have been fully considered but they are not persuasive with respect to the patentability of the independent claims and various dependent claims over the Kamatani et al. reference.

The claims have been amended to exclude some of the compounds disclosed by Kamatani et al., including applicant's originally elected species and the specific compounds referenced by the examiner in the Office action mailed November 15, 2006. (For the record, in the first paragraph on page 5 of the November 15<sup>th</sup> action, the examiner should have referenced Kamatani's Compound Nos. 64-69 instead of 75-80, but none of 64-69 and 75-80 is within the scope of the dopant/compound of the present claims.) However, the rejected claims do encompass other specific compounds disclosed in the Kamatani et al. reference, examples of

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which are referenced by the examiner in the rejection under 35 U.S.C. 102(b) as set forth in this action.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY  
May 11, 2007

*Marie R. Yamnitzky*

**MARIE YAMNITZKY  
PRIMARY EXAMINER**

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